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Fluctuation of chicken meat price in European Union in 2007-2018



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Aim of study

The aim of this work was analysis of price level and influence of particular kind of fluctuation on variability range of chicken meat price in European Union as a whole market and chosen particular countries of EU.

Materials

Research material consist of monthly time series of chicken meat price in whole European Union and particular countries for the years 2007 - 2018. Data come from Integrated System of Agricultural Information supervised by Ministry of Agriculture in Poland.

Methods

The analysis of the price variability for broiler chicken meat was conducted with a price time series decomposition. Time series were described by multiplicative model and decomposition was performed using Census X-11 method.

Trend was isolated using Hodrick-Prescot filter with $\lambda=14400$

A time series (Y_t) includes the following elements:

$$Y_t = T_t \cdot C_t \cdot S_t \cdot I_t$$

Trend (T) – it shows the long-term tendency for one-way changes (increase or decrease) of the price. It is understood as the effect of the influence of a constant set of factors,

Cyclic fluctuations (C) – they are formed as long-term, rhythmically repetitive price fluctuations around the developmental tendency in time intervals longer than one year,

Seasonal fluctuations (S) – are price fluctuations of the observed variable (price) around the developmental tendency and repeat in a time interval not longer than one year.

Random fluctuations – random element – (I).

Results

In the period 2006-2017 the highest prices occurred in Germany 254 €/100kg, Finland 246 €, Cyprus 242 €, Denmark 226 €. The lowest occurred in: Poland 131 €, Great Britain 148 €, Bulgaria 149 €, Portugal 160 € (Figure 1).

Price of broiler chicken meat in European Union average in year 2007 was on the level of 176 EURO per 100kg. During twelfth years period meat prices were subject different fluctuations and finally increased to the level of 186 EURO in year 2018 (Figure 2).

Prices of chicken meat in EU were significantly ($p<0,0001$; Test F-33,0) influenced by seasonal fluctuation: generally higher prices are in the summer (102.6% in June) and lower in the winter (98.5% in December) (Figure 3).

Seasonal fluctuations constituted the major share in the total price variability of chicken meat in a horizon of changes from one to six months (Table). In longer horizon of changes (from seven to twelve months) share of cyclic fluctuations constituted more than half of the total variability (from 52,1% to 98,1% respectively). Irregular fluctuations in a month horizon of changes amounted to 24,5% of the total variability, whereas in a four-month horizon their share was under 5%.

Table. Share of seasonal, cyclic and irregular changes in the total price variability of in 2007-2018

Horizon of changes (months)	Changes %		
	irregular	cyclic	seasonal
1	24,5	20,6	54,9
2	10,0	29,5	60,5
3	5,4	33,8	60,8
4	4,3	35,7	60,0
5	2,6	39,1	58,3
6	2,0	43,8	54,2
7	1,9	52,1	46,0
9	2,0	75,8	22,2
11	1,7	94,7	3,6
12	1,8	98,1	0,1
Mean	5,6	52,3	42,1

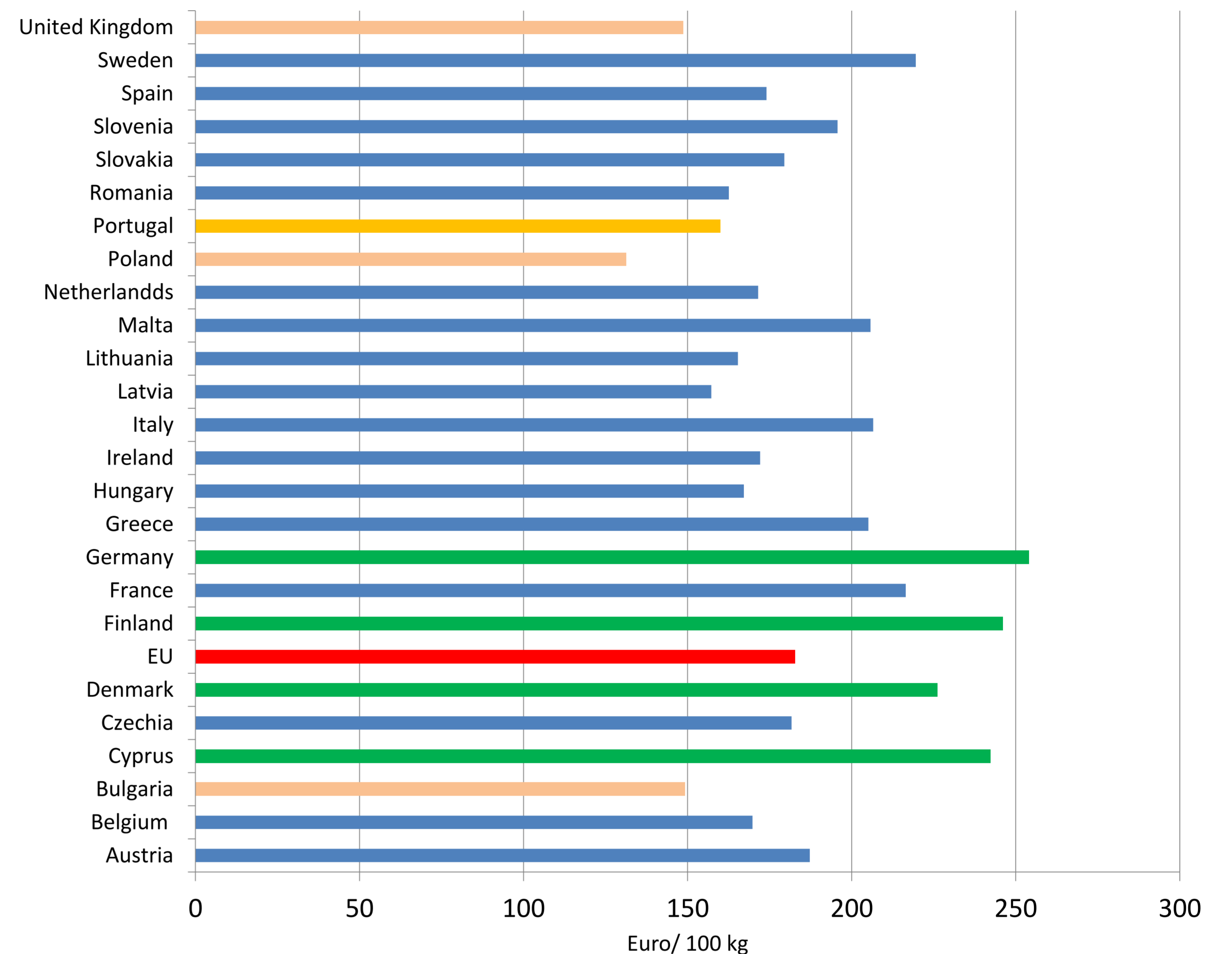
Source: own study based on: Integrated System of Agricultural Market Information, 2018

Acknowledgements

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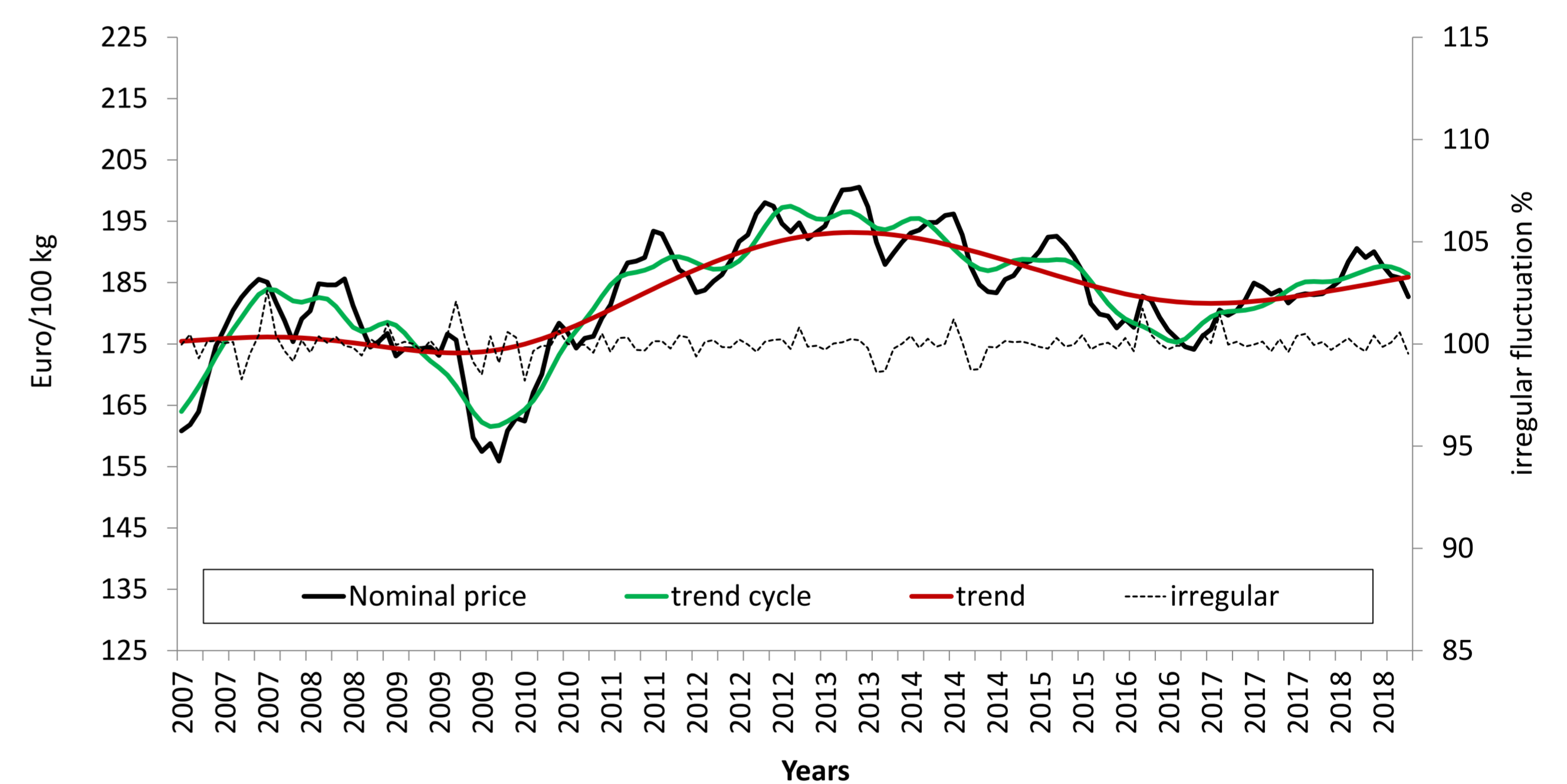


Figure 1. Prices of broiler chicken meat in EU countries as average in 2007-2018



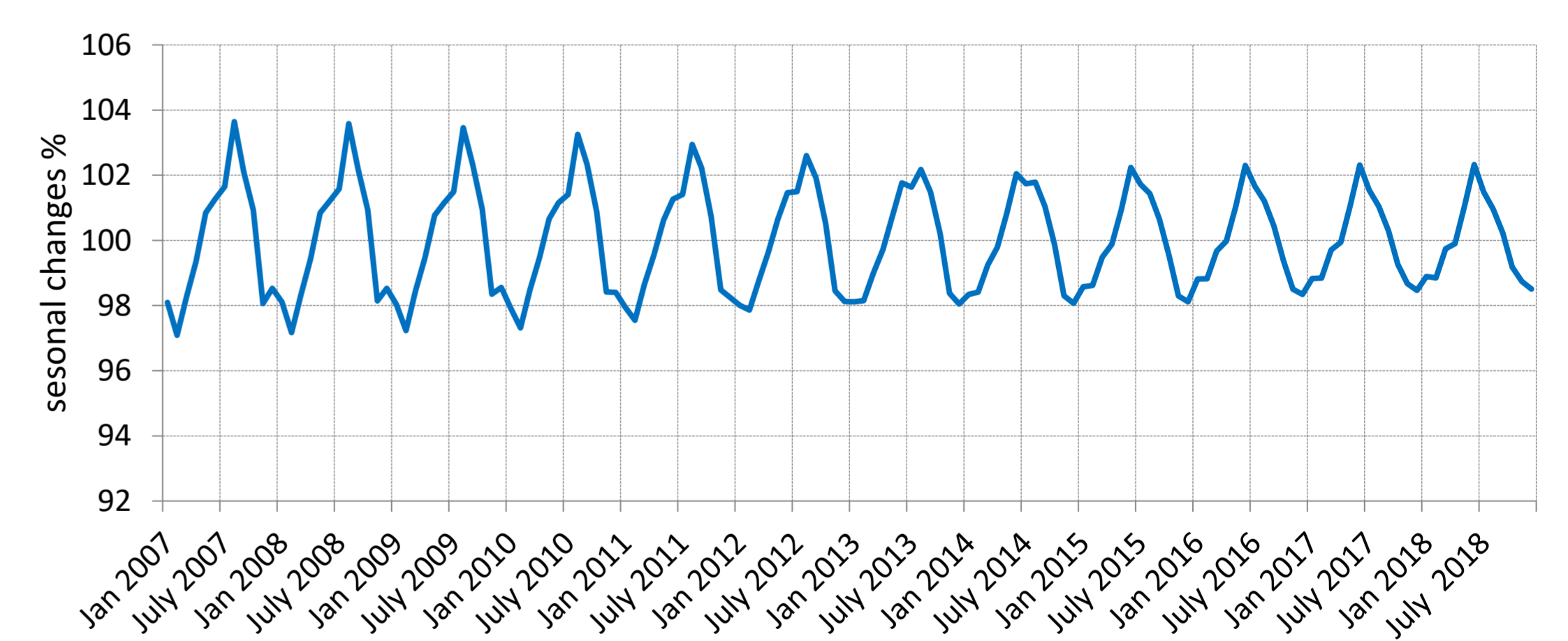
Source: own study based on: Integrated System of Agricultural Market Information, 2018

Figure 2. Fluctuation of broiler chicken meat prices in EU in years 2006-2017



Source: own study based on: Integrated System of Agricultural Market Information, 2018

Figure 3. Seasonal fluctuation of broiler chicken meat prices in EU in years 2007-2018



Source: own study based on: Integrated System of Agricultural Market Information, 2018

Conclusions

1. Despite the common market in the European Union, there is a significant spatial differentiation of meat prices for broiler chickens between member countries..
2. According to the law of one price on a functioning common poultry market in the EU, it can be expected that the future prices between individual countries will be offset by.
3. In the one year time horizon variability of prices was shaped in 5,6% by irregular changes, 42.1% by seasonal and 52.3% by cyclical fluctuation.
4. The separated components of the time series can be used to prepare a forecast of prices of broiler livestock.